ANNEXURE-1

TERMS OF REFERENCES

- TOR prescribed by MoEF & CC for this sector will be taken into account.
- To use Baseline Monitoring of M/s. Unique Chemicals for the Month of January, February & March 2017.

ANNEXURE-2

LIST OF PRODUCTS

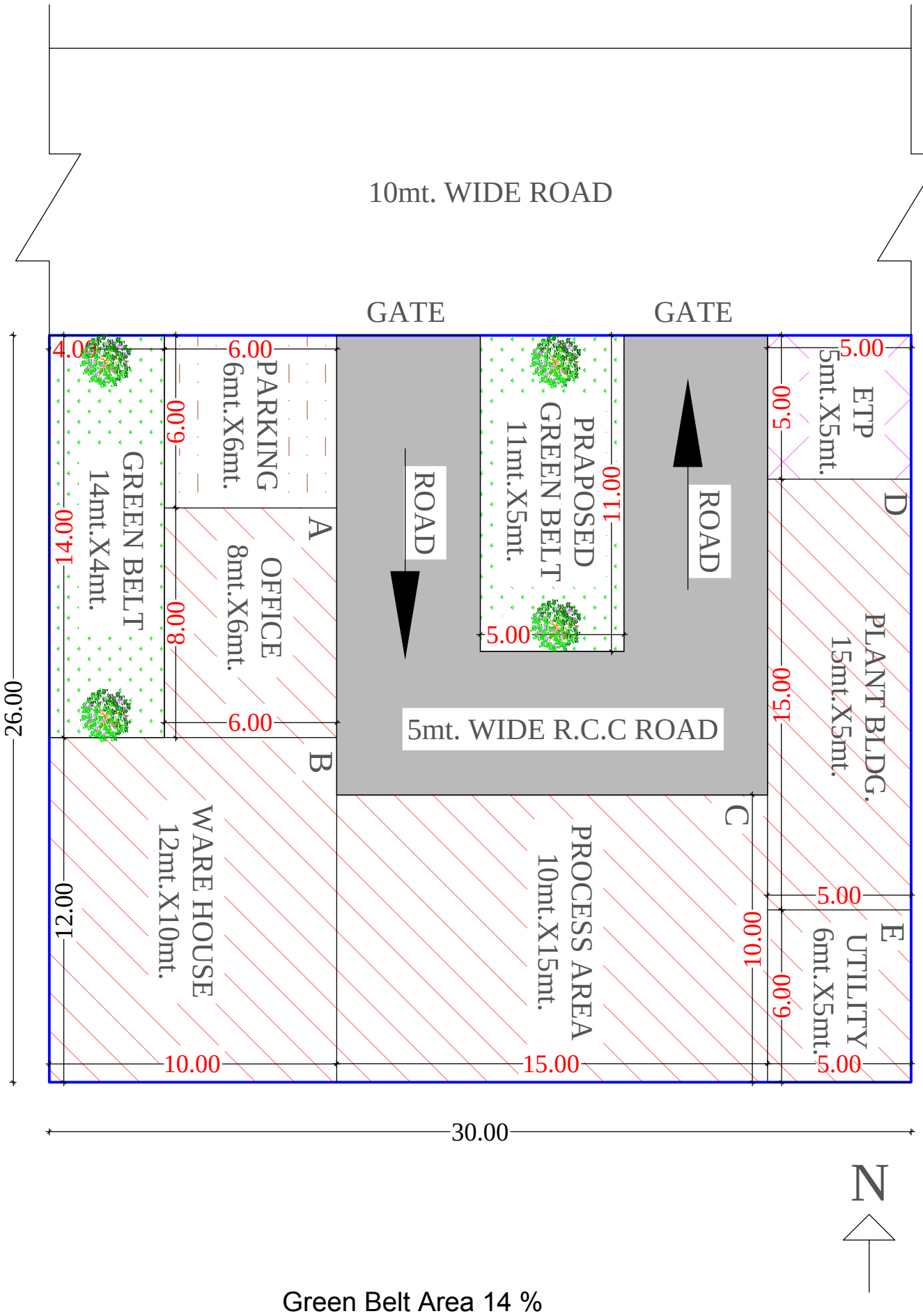
Sr. No.	Product Name	Existing as per CCA AWH-62500 Quantity MT/M	Proposed Quantity MT/M	Total Quantity after proposed expansion MT/M
1.	Ammonium Chloride	190	0	190
2.	Sodium 2 ethyl Hexanoate	0	10	10
3.	Cocamidopropyl Betanine	0	50	50
4.	Glycerol Monostearate	0	50	50
5.	Sorbiton Monooleate	0	50	50
6.	1 H 1,2,4 Triozole	0	10	10
7.	4 Amino 1,2,4 Triozole	0	10	10
8.	Sorbiton Monostearate	0	50	50
9.	Sulphanilic Acid	0	100	100
	Total	**190**	**330**	**520**
	By Products			
1.	Titanium Dioxide	8	10	18
	Total	**198**	**340**	**538**

ANNEXURE-3

LIST OF PROPRIETOR

Sr. No.	Name of the Proprietor	Address	Contact No.
1.	Balasaheb Kadlag	30, Akash Villas Co operative Housing Society, Nr. GIL Colony, Ankleshwar GIDC, Ankleshwar	8155067212

ANNEXURE- 4 PLANT LAYOUT



Green Belt Area 14 %

STAMP OF APPROVAL

AREA TABLE

NAME	SIZE	SQ.MT.
BLOCK A	8.0X6.0	48.00
BLOCK B	12.0X10.0	120.00
BLOCK C	10.0X15.0	150.00
BLOCK D	15.0X5.0	75.00
BLOCK E	6.0X5.0	30.00
GREEN BALT	11.0X5.0	55.00
GREEN BALT	14.0X4.0	56.00
PARKING	6.0X6.0	36.00
ETP	5.0X5.0	25.00
ROAD		185.00
TOTAL AREA		780.00

PLAN SHOWING EXISTING & PROPOSED FACTORY BUILDING OF KALYANI CORPORATION
PLOT NO.- 906/23 , GIDC PANOLI, DIS.-BHARUCH

SIGN OF PARTNER

SCALE	DATE	DRG.NO.
1:100		

Designer View
ARCHITECTURAL PLANNER & INTERIOR DESIGNER
GOVR.APP.ENGINEER, LIC. NO.BAUDA -L-ER-02, A.N.P.STRU.29-2010.
S / 9 , Silver Plaza , Nr. Pratin Chokdi , Ankleshwar G.I.D.C.
E-mail: designerview1910@gmail.com, Cell :- 098980 84841.

ANNEXURE-5

LIST OF PRODUCTS WITH RAW MATERIAL

Sr. No.	Product	Total Quantity after Expansion (MT/M)	Name of the Raw Material	Total Quantity after Expansion (MT/M)
1.	Ammonium Chloride	190	Crude Ammonium Chloride	380
			Total	**380**
2.	Sodium 2-Ethyl Hexanoate	10	Octoic Acid	10
			Caustic Prill	2.87
			Toluene	0.52
			Methanol	0.68
			Total	**14.07**
3.	Cocamidopropyl Beta Amine	50	Coconut Oil	9.74
			Dimethyl amine	5.01
			Sodium Boro Hydrate	0.01
			Mono Chloro Acetic Acid	1.98
			Caustic Flakes	1.98
			D M Water	31.75
			Total	**50.47**
4.	Glycerol Monostearate	50	Glycerine	13.88
			Stanic Acid	41.67
			Caustic Flakes	0.29
			Total	**55.84**
5.	Sorbiton Monooleate	50	Sorbitol 70%	23.74
			Oleaic Acid	24.09
			Fatty Acid	16.06
			Caustic Flake	0.11
			Total	**64**
6.	1H 1,2,4 Triozole	10	Formic Acid	12.50
			Ammonia Gas	3.75
			Hydrazine Hydrate	4.25
			Total	**20.5**
7.	4 Amino 1,2,4 Triozole	10	Hydrazine Hydrate	16.67
			Formic Acid	14.33
			Iso Propyl Alcohol	0.27
			Total	**31.27**
8.	Sorbiton Monostearate	50	Sorbitol 70 %	26.85
			Stanic Acid	41.30
			Caustik Flakes	0.11

			Total	68.26
9.	Sulphanilic Acid	200	Aniline	107.94
			Sulphuric Acid	114.29
			Total	**222.23**

ANNEXURE 6

DETAILS OF MANUFACTURING PROCESS

1. AMMONIUM CHLORIDE

Brief Manufacturing Process

- Charge Water in reactor, rise temperature upto 60-70 °C.
- Charge crude Ammonium Chloride
- Raise temperature upto 85-90 °C
- Dissolve Ammonium Chloride into water & settle mass for 1 to 1.30 hour
- Transfer most of the material to crystallizer through filter press
- After 48 hours when material is crystallize then charge the material into centrifuge
- Ammonium chloride crystals will be formed
- Pack the material into 50 kg HDPE bags
- Centrifuge ML having 30-35% ammonium chloride content will be used in next batch
- Further Ammonium Chloride solution containing Titanium Dioxide impurities will be passed through the filter press.
- Wet cake from filter press containing Titanium Dioxide will be dried and pulverized to make powder.
- Pulverized powder will be packed into bags and sold.

Chemical Reaction

There is no chemical reaction

Material Balance

Input:

Raw Material	Input. Kgs
Crude NH_4CL	2000
Fresh Water	3200
Total	**5200**

PURIFICATION

Output:

Product	Output. Kgs
Pure NH_4Cl	1000
ML + NH_4Cl	4150
Titanium Oxide (TiO_2)	50
Total	**5200**

Input:

Raw Material	Input. Kgs
Crude NH_4Cl	1050
NH4Cl Solution 30% (from previous batch)	4150
Total	**5200**

Next Batch PURIFICATION

Output:

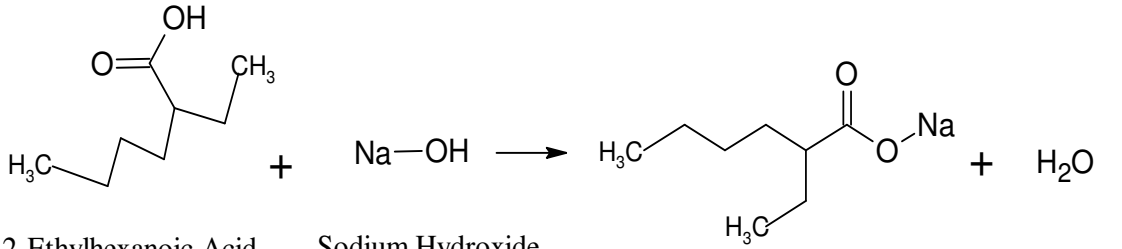
Product	Output. Kgs
Product	1000
NH_4Cl + Water	4100
Titanium Oxide (TiO_2)	50
Evaporation Loss	50
Total	**5200**

2. SODIUM 2 ETHYL HEXANOATE

Brief Manufacturing Process

- Prepare 40% caustic solution in reactor, then charge Octoic Acid in reactor in temperature range 40-45°C, and control the temperature by cooling.
- Start circulation for 1 hour & maintain pH-9.2 to 9.5.
- Charge 630 kg DM water within 1-5 hours and 265 kg toluene within 1 hour.
- Circulate the material for 30 minutes and keep for settle for 30 minutes then separate aqueous layer and toluene layer.
- Transfer the aqueous layer to reactor through sparkler filter for 30 minutes and check the pH. It should be 8.8 to 9.3.
- If require adjust the pH, then take sample & check for pH, NTU and free acidity.
- If sample is Ok then start water recovery by vaccum simple distillation at temperature 105°C.
- Cool reaction mass for 70°C within 2 hours.
- Charge 650 liter methanol with 1 hour.
- Stir well up to total uniform slurry under cooling temperature upto 50°C & check m/c % the charge 6 kg activated charcoal powder & stir for 30 minutes
- After evaporation , when crystal clear liquid collect in SS rector for methanol recovery, then unload the product in empty open mouth carboy/drum.
- Then charge material in vacuum tray dryer.
- Start dehumidifier & maintain dryer temperature up 50 RH.
- Maintain dryer temperature 65-70°C.
- Pulvarise in multi mill & pack in drum

Chemical Reaction



2-Ethylhexanoic Acid
M.W. 144

Sodium Hydroxide
M.W. 40

Sodium 2-Ethylhexanoate
M.W. 166

Water
M.W. 18

Material Balance

Input:

Raw Material	Input. Kgs
Octoic Acid	380
Caustic Prill	109
DM Water	1000
Toluene	300
Total	**1789**

REACTION

Output:

Product	Output. Kgs
Reaction Mass	1509
Toluene Recovered	280
Total	**1789**

Input:

Raw Material	Input. Kgs
Reaction Mass	1509
Total	**1509**

SEPERATION

Output:

Product	Output. Kgs
Crude Wet Product	480
Water Recovery	1029
Total	**1509**

Input:

Raw Material	Input. Kgs
Reaction Mass	480
Methanol	650
Total	**1130**

PURIFICATION

Output:

Product	Output. Kgs
Product	450
Methanol + Water	675
Evaporattion Loss	5
Total	**1130**

Input:

Raw Material	Input. Kgs
Product	450
Total	**450**

DRYING

Output:

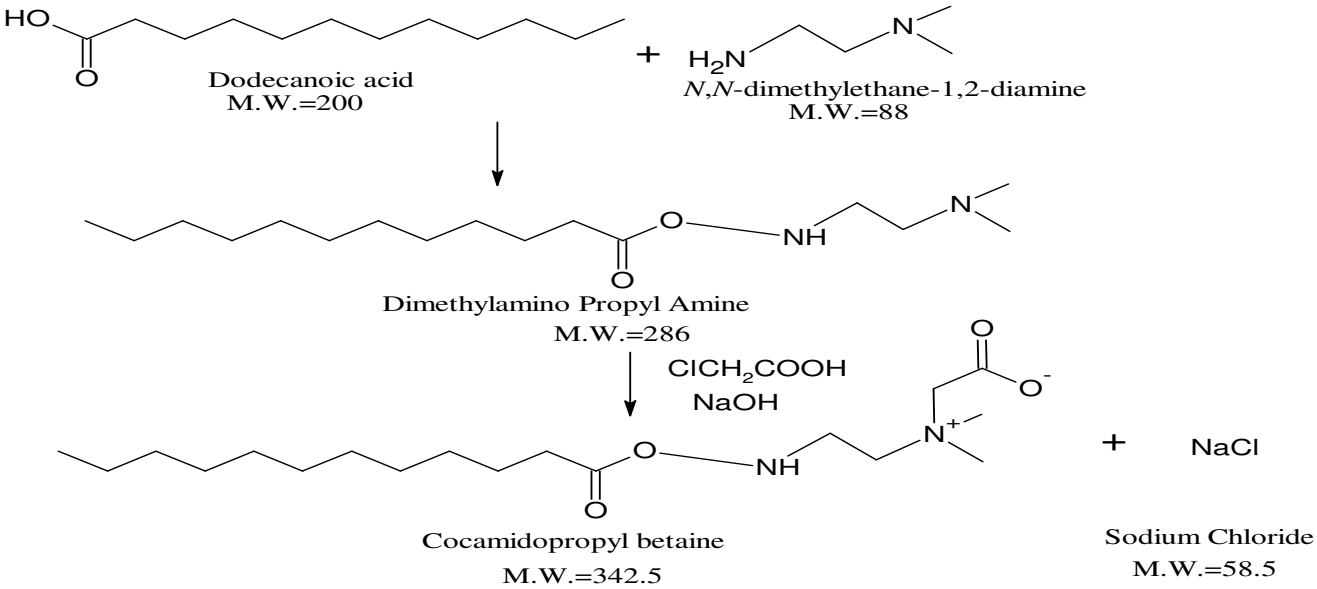
Product	Output. Kgs
Product	380
Evaporation Loss	70
Total	**450**

3. COCAMIDOPROPYL BETAMINE

Brief Manufacturing Process

- Charge coconut oil & dimethyl amine in SS reactor.
- Start stirring & heating at 50°C charge sodium boro hydrate powder under stirring through manhole.
- At 90 °C temperatures reflux will start. Maintain reflux at 130 -135 °C for 3 hours then unreacted amine recovered in receiver.
- Amine content should be 175 to 185 ppm in reaction mass. If it is ok then start cooling & drop temperature up to 50°C to 60°C, then store this material in IBC or drum.
- Charge (cocapa) 720 kg in reactor then charge 1200 liter DM water.
- Charge 100 kg caustic flake 100 kg DM water and make 50 % solution of caustic lye.
- Then 230 kg MCAA, dissolve it in 200 lit DM water and make 50% solution
- Then charge caustic solution and MCAA solution simultaneously in rector under stirring at room temperature
- Then start boiler and rise temperature upto 90-95°C and maintain this temperature for 1 to 1.5 hours.
- Then after check sample for NaCl % & pH.
- pH should be 5.6 & Nacl content should be 6-7 ppm. If it is less than 6-7 ppm than charge more Nacl.
- If all above parameters are maintained then drop temperature of reaction mass 50 – 60 °C.
- Check the sample for % of CAPB. If it is more than 37% then charge D M water & maintain 37% & store in drum or IBC tank.

Chemical Reaction



Material Balance

Input:

Raw Material	Input. Kgs
Coconut Oil	2455
Dimethyl amine	1263
Sodium Boro Hydrate	2
Total	**3720**

1st STAGE REACTION

Output:

Product	Output. Kgs
Reaction Mass	3670
Water Evaporation Loss	50
Total	**3720**

Input:

Raw Material	Input. Kgs
Reaction Mass	3670
D M Water	8000
Mono Chloro Acetic Acid	500
Caustic Flakes	500
Total	**12670**

2nd STAGE REACTION

Output:

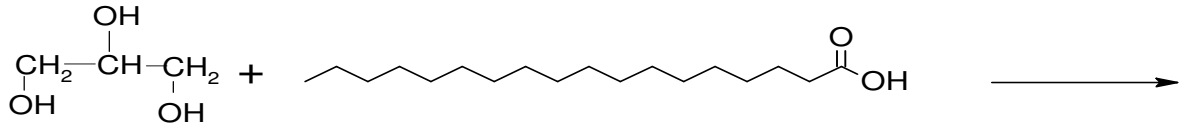
Product	Output. Kgs
CAPB	12600
Evaporation Loss	70
Total	**12670**

4. GLYCEROL MONOSTEARATE

Brief Manufacturing Process

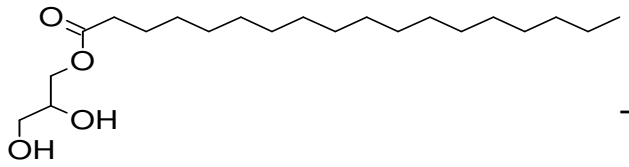
- Charge glycerin 660 kg in SS reactor & 2000 kg Staric acid.
- Then start heating & rise temperature upto 100°C than charge 14 kg caustic flaker
- Charge nitrogen purging at 115°C then rise temperature upto 220°C for 1 hour.
- Then apply cooling & drop temperature upto 100°C and
- Maintain flaker temperature 0°C to 10°C.
- Flake pack into 25 kg bags

Chemical Reaction



Glycerine
M. W.= 92

Stearic Acid
M. W.= 284



Glycerol monostearate
M. W.= 358

+ H_2O

Water
M. W.= 18

Material Balance

Input:

Raw Material	Input. Kgs
Glycerine	666
Staric Acid	2000
Caustic Flakes	14
Total	**2680**

Ist STAGE REACTION

Output:

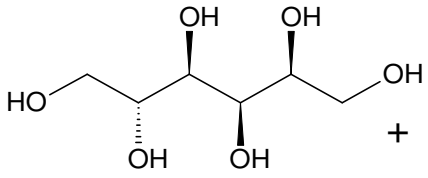
Product	Output. Kgs
Product	2400
Evaporation Loss	280
Total	**2680**

5. SORBITON MONO OLEATE

Brief Manufacturing Process

- Charge Oleaic acid in SS reactor, then charge sorbitol & charge 1060 kg fatty acid.
- Start heating & rise temperature upto 115°C.
- Then charge 7 kg caustic flakes at 140°C then start purging Nitrogen gas under stirring.
- Under stirring maintain 240°C for 2 hour, then stop heating & down temperature by cooling at 180°C.
- Transfer the material to another reactor & keep it for settling for 2 hours. Separate solid emulsion from bottom of reactor. Then start stirring & drop temperature upto 90°C

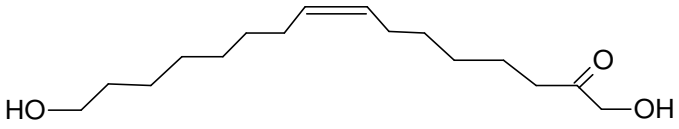
Chemical Reaction



Sorbitol

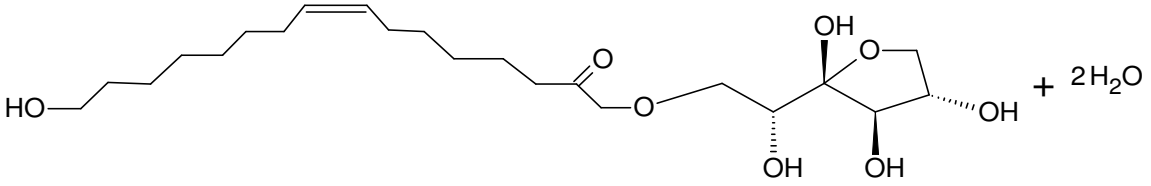
M.W.= 182

+



Oleaic Acid

M.W.= 282



Sorbitan Monooleate
M.W.= 428

Water
M.W.= 2X18=36

Material Balance

Input:

Raw Material	Input. Kgs
Sorbitol 70%	1567
Oleaic Acid	1590
Fatty Acid	1060
Caustic Flake	7
Total	**4224**

REACTION

Output:

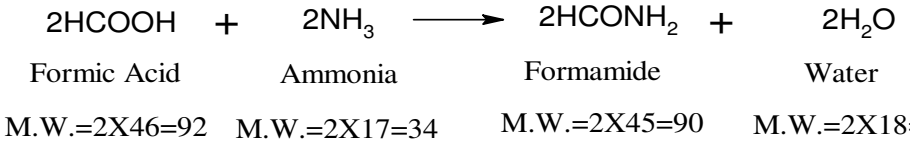
Product	Output. Kgs
Product	3300
Evaporation Loss	924
Total	**4224**

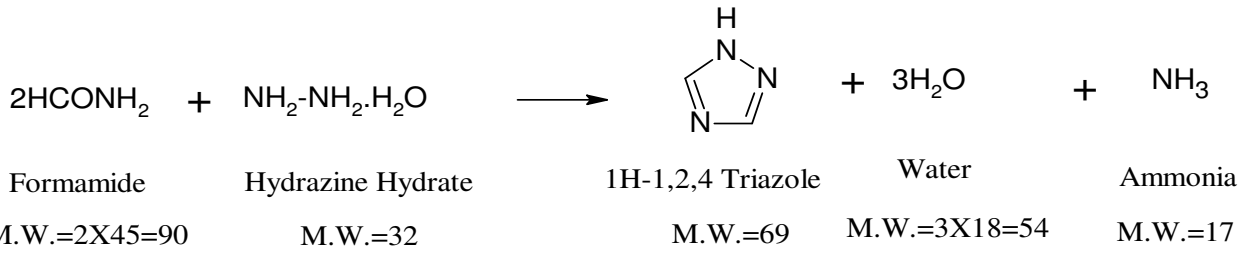
6. 1 H 1,2,4 TRIAZOLE

Brief Manufacturing Process

- Charge 500 kg formic acid in SS reactor. Then slowly pass ammonia gas up to pH 8 then cool this mass at room temperature.
- It gets completely solidification. Then heat this material up to 140°C water will be removed completely.
- Then rise temperature upto 180°C.
- Slowly add hydrazine hydrate at 180°C within 5 to 6 hours.
- After addition completed, maintain it for 2 hours.
- Then cool to 100°C & then unload in SS tray, it will get completely solidify in tray
- Get it wash & load in centrifuge wash with 50 kg chilled methanol
- Then charge material in tray dryer & dry it for 60 to 65 °C and then packed it in fiber drum

Chemical Reaction





Material Balance

Input:

Raw Material	Input. Kgs
Formic Acid	500
Ammonia Gas	150
Total	**650**

AMIDATION

Output:

Product	Output. Kgs
Reaction Mass	650
Total	**650**

Input:

Raw Material	Input. Kgs
Reaction Mass	650
Hydrate	170
Total	**820**

CONDENSATION

Output:

Product	Output. Kgs
Reaction Mass	510
Water	310
Total	**820**

Input:

Raw Material	Input. Kgs
Reaction Mass	510
Total	**510**

CENTRIFUGE

Output:

Product	Output. Kgs
Wet Cake	425
Mother Liquor	85
Total	**510**

Input:

Raw Material	Input. Kgs
Wet Cake	425
Total	**425**

DRYING

Output:

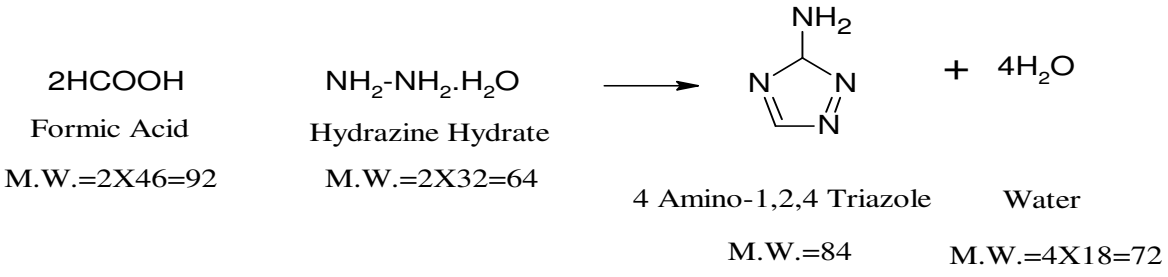
Product	Output. Kgs
Product	400
Evaporation Loss	25
Total	**425**

7. 4AMINO 1,2,4 TRIOZOLE

Brief Manufacturing Process

- Charge 1000 kg hydrazine hydrate in SS reactor, then slowly add 860 kg formic acid between room temperature to 60 °C.
- After addition completed increase temperature upto 80 °C & maintain it for 2 hours, then temperature rise slowly upto 140 °C.
- Water will be completely removed then cool reaction mass to 80 °C & then charge 500 lit IPA.
- Then cool this reaction mass to room temperature & chilled at 10°C.
- Then material transfer to centrifuge. Wash the material with 5 liter IPA. Unload material from centrifuge and send it to dryer.
- Dry this material at 60-65°C for 2-3 hours and then pack it in fiber drum.

Chemical Reaction



Material Balance

Input:

Raw Material	Input. Kgs
H Hydrate	1000
Formic Acid	860
Total	**1860**

CONDENSATION

Output:

Product	Output. Kgs
Reaction Mass	1080
Evaporation Loss	780
Total	**1860**

Input:

Raw Material	Input. Kgs
Reaction Mass	1080
Iso Propyl Alcohol	400
Total	**1480**

WASHING

Output:

Product	Output. Kgs
Wet Product	650
IPA + Water	830
Total	**1480**

Input:

Raw Material	Input. Kgs
Product	650
Total	**650**

CENTRIFUGE

Output:

Product	Output. Kgs
Product	625
Mother Liquor	25
Total	**650**

Input:

Raw Material	Input. Kgs
Wet Product	625
Total	**625**

DRYING

Output:

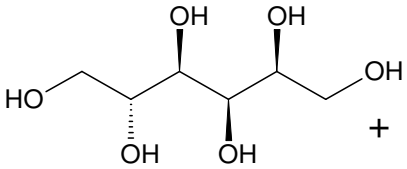
Product	Output. Kgs
Dry Product	600
Evaporation Loss	25
Total	**625**

8. SORBITON MONOSTEARATE

Brief Manufacturing Process

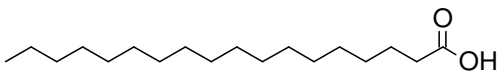
- Charge 1235 kg sorbitol 70% in reactor and then charge 1900 kg stannic acid.
- Start heating upto 100 °C and start stirrer. Than charge caustic flake at 140°C then close manhole of reactor & start nitrogen purging and rise temperature upto 220 °C. Maintain temperature upto 220°C for 15-30 minute and then cool this material upto 180°C.
- Transfer this material to second rector & keep it for settling for 2 hours.
- Separate solid emulsion from bottom valve of reactor. Then start cooling and drop temperature upto 95°C and then pack in 25 kg bags.

Chemical Reaction



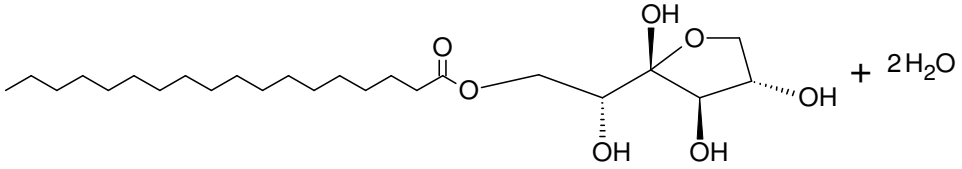
Sorbitol

M.W.= 182



Stearic Acid

M. W.= 284



Sorbitan Monostearate

M.W.= 428

Water

M.W.= 2X18=36

Material Balance

Input:

Raw Material	Input. Kgs
Sorbitol 70 %	1235
Stanic Acid	1900
Caustik Flakes	5
Total	**3140**

REACTION

Output:

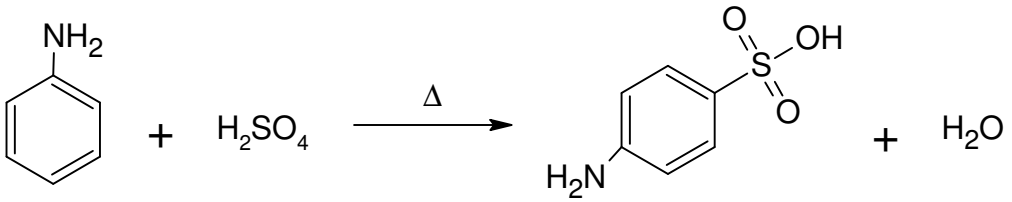
Product	Output. Kgs
Reaction Mass	2300
Evaporation Loss	840
Total	**3140**

9. SULPHANILIC ACID

Brief Manufacturing Process

- Charge 370 kg sulphuric acid & 350 kg aniline in ball mill.
- Then start heating for 3 hours and check reaction mass for free Aniline.
- If there is free aniline in reaction mass then charge sulphamic acid according to mole ratio. When free aniline is remain 0.2 to 0.5% maximum then stop heating & discharge the product from manhole of ball mill & pack in 50 kg HDPE woven bags.

Chemical Reaction



Aniline	Sulphuric Acid	Sulphanilic Acid	Water
M.W.=93	M.W.=98	M.W.=173	M.W.=18

Material Balance

Input:

Raw Material	Input. Kgs
Aniline	340
Sulphuric Acid	360
Total	**700**

REACTION

Output:

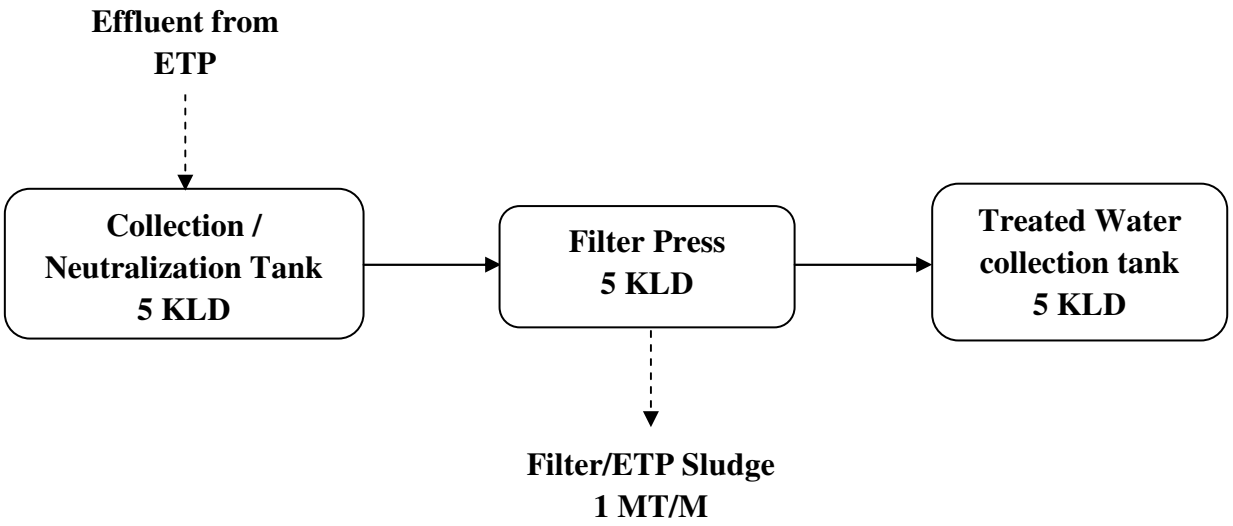
Product	Output. Kgs
Reaction Mass	630
Evaporation Loss	70
Total	**700**

ANNEXURE-7

DETAILS OF EFFLUENT TREATMENT SCHEME AND LIST OF PLANT MACHINERY

- Generated ETP effluent will be collected into ETP collection/ neutralization tank
- pH will be neutralizalized into the pH neutralized tank
- Further the effluent will be sent to filter press
- Sludge will be separated filter press. Separated sludge will be sent to TSDF site
- Filtrate from filter press will be collected in treated effluent tank.
- Treated effluent will be reused in process

Primary Treatment Facility



LIST OF ETP COMPONENTS

Sr. No.	ETP Components	No. of Components
1.	Collection/ Neutralization Tank	1 Nos.
2.	Filter Press	1 Nos.
3.	Treated Water Collection Tank	1 Nos.

ANNEXURE – 8

DETAILS OF WATER CONSUMPTION

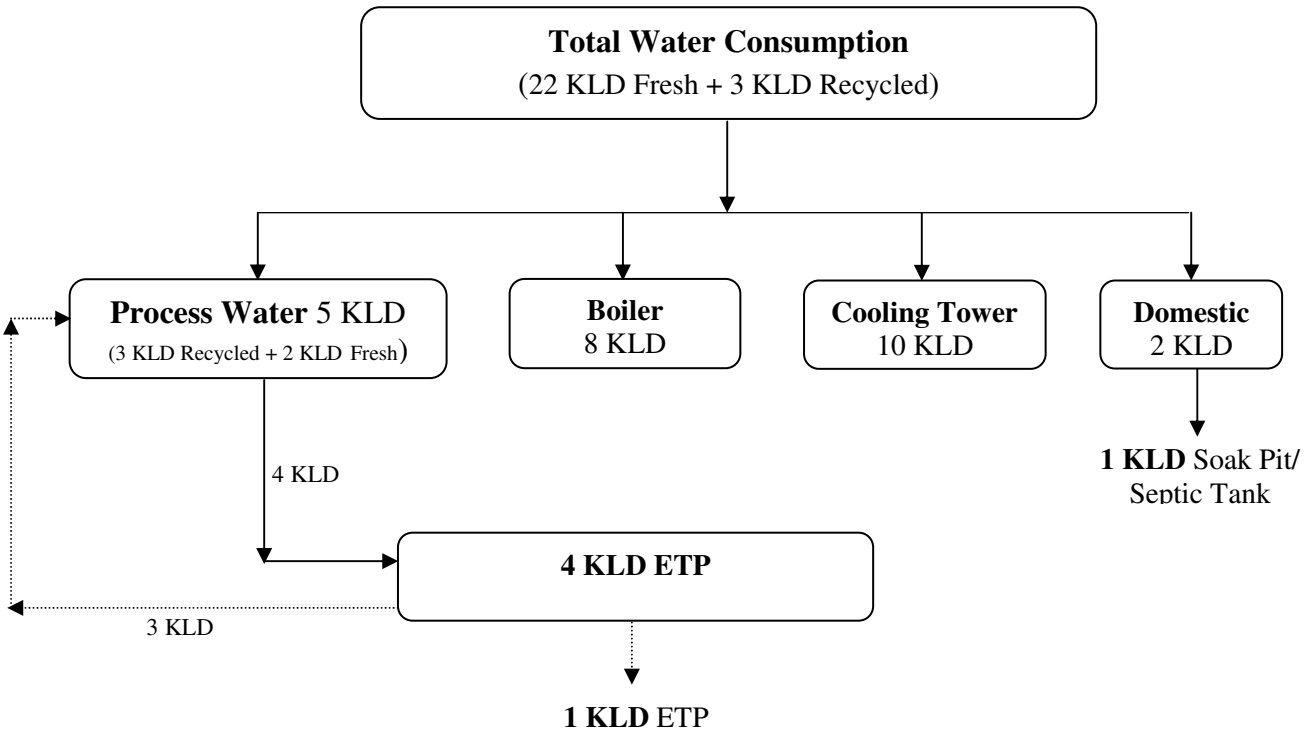
Sr. No	Particulars	Existing Water Consumption (As per CCA-No:-AWH-62500) Kl/Day	Proposed Water Consumption (As per proposed expansion) Kl/Day			Total Water Consumption after Expansion Kl/Day		
			Fresh	Recycle	Total	Fresh	Recycle	Total
1.	**Domestic**	**0.5**	**1.5**	0	2	2	0	2
2.	**Industrial**							
	Process	0.25	1.75	3	4.75	2	3	5
	Boiler	0.75	7.25	0	7.25	8	0	8
	Cooling	0	10	0	10	10	0	10
	Total Industrial	**1**	**19**	**3**	**22**	**20**	**3**	**23**
	TOTAL (Domestic + Industrial)	**1.5**	**20.5**	**3**	**23.5**	**22**	**3**	**25**

DETAILS OF WASTE WATER GENERATION

Sr. No.	Particulars	Existing Waste Water Generation KL/Day (As per CCA AWH -62500)	Proposed Waste water Generation KL/Day	Total Waste Water Generation after expansion KL/Day
1.	**Domestic**	0.4	0.6	1
2.	**Industrial**			
	Process	0	4	4
	Boiler	0	0	0
	Cooling	0	0	0
	Total Industrial	**0**	4	4*
	TOTAL (Domestic + Industrial)	**0.4**	**4.6**	**5***

* Out of 5 KLD waste water generation , 4KLD generated waste water will be reused in process & 1 KLD domestic waste water will be disposed through Soak Pit/ Septic Tank. Hence, Unit will maintain Zero Liquid Discharge

WATER BALANCE DIAGRAM



ANNEXURE 9

DETAILS OF ENERGY & FUEL CONSUMPTION

Sr. No.	Particulars	Existing requirement as per CCA AWH 62500	Proposed requirement	Total requirement after expansion	Remark
1.	Electricity	45 KVA	35 KVA	80 KVA	Will be met through Electricity company
2.	Natural gas	100 NM^3/Day	800 NM^3/Day	900 NM^3/Day	Will be supplied by Gujarat Gas company Ltd.
3.	LDO/ FO	0	450 Lit/Day	450 Lit/ Day	Local Supplier
4.	Diesel (in case of power failure, DG set will be operated)	0	30 Lit/Hr	30 Lit/ Hr	Local suppliers

* LDO/ FO will be used in case of non availability of Natural Gas

ANNEXURE-10

DETAILS OF HAZARDOUS WASTE

Sr. No.	Name of Hazardous Waste	Category	Existing Quantity as per CCA 62500 MT/Year	Proposed Quantity MT/Year	Total Quantity after proposed expansion MT/Year	Mode of Disposal
1.	Effluent Treatment Plant Sludge	35.3	0	12 MT/Y	12 MT/Y	Collection, Storage, Transportation & disposal at TSDF site.
2.	Used Oil	5.1	0	0.2 MT/Y	0.2 MT/Y	Collection, Storage, Transportation & sale to authorized vendor
3.	Empty Barrels/ Containers/ Liners Contaminated with hazardous chemicals/ wastes	33.1	2.00	2.00 MT/Y	4.00 MT/Y	Disposal by reuse or incineration in common incinerator of BEIL, Ankleshwar

ANNEXURE- 11

DETAILS OF FLUE GAS EMISSION

Existing Flue Gas Emission as per CCA -62500							
Sr. No.	**Stack attached to**	**Stack Height (m)**	**Type of fuel**	**Fuel consumption**	**Type of emission**	**Permissible Limit**	**APCM**
1.	Boiler	11.5	Natural Gas	100 NM^3/Day	PM SO_2 NO_2	150 mg/Nm^3 100 ppm 50 ppm	---
Proposed Flue Gas Emission							
1.	Steam Boiler (1 TPH)	30 m	Natural Gas **OR**	33 NM^3/hr 800 NM^3/Day	PM SO_2 NO_2	150 mg/Nm^3 100 ppm 50 ppm	---
			LDO/FO	25 Lit/Hr			
2.	TFH (2,50,000 Kcal/Hr)	11 m	Natural Gas **OR**	33 NM^3/hr 800 NM^3/Day	SPM SO_2 NO_2	150 mg/Nm^3 100 ppm 50 ppm	---
			LDO/FO	25 Lit/Hr			
3.	D.G.Set (100 KVA) (1Nos.)	11 m	Diesel	30 Liter/Hr	SPM SO_2 NO_2	150 mg/Nm^3 100 ppm 50 ppm	Adequate Stack Height
FLUE GAS EMISSION AFTER PROPOSED EXPANSION							
1.	Boiler	11.5	Natural Gas	100 NM^3/Day	PM SO_2 NO_2	150 mg/Nm^3 100 ppm 50 ppm	---
2.	Steam Boiler (1 TPH)	30 m	Natural Gas **OR**	33 NM^3/hr 800 NM^3/Day	PM SO_2 NO_2	150 mg/Nm^3 100 ppm 50 ppm	---
			LDO/FO	25 Lit/Hr			

3.	TFH (2,50,000 Kcal/Hr)	11 m	Natural Gas **OR**	33 NM^3/hr 800 NM^3/Day	SPM SO_2 NO_2	150 mg/Nm^3 100 ppm 50 ppm	---
			LDO/FO	25 Lit/Hr			
4.	D.G.Set (100 KVA) (1Nos.)	11 m	Diesel	30 Liter/Hr	SPM SO_2 NO_2	150 mg/Nm^3 100 ppm 50 ppm	Adequate Stack Height

DETAILS OF PROCESS GAS EMISSION

Sr. No.	Stack Attached To	Stack Height(m)	Air Pollution Control System	Parameter	Permissible Limit
1.	Fluid Bed Dryer (1 Nos.)	30 m	Bag Filter	PM	150 mg/Nm^3
2.	Tray Dryer (1 Nos.)	30 m	Bag Filter	PM	150 mg/Nm^3
3.	Vent attached to reactor	25 m	Water scrubber Charcoal Tower	H_2S VOC	40 mg/Nm^3 ---
4.	Vent attached to reactor	18 m	Water Scrubber & Caustic Scrubber	Cl_2	09 mg/Nm^3
5.	Vent attached to reactor			HCL	20 mg/ Nm^3

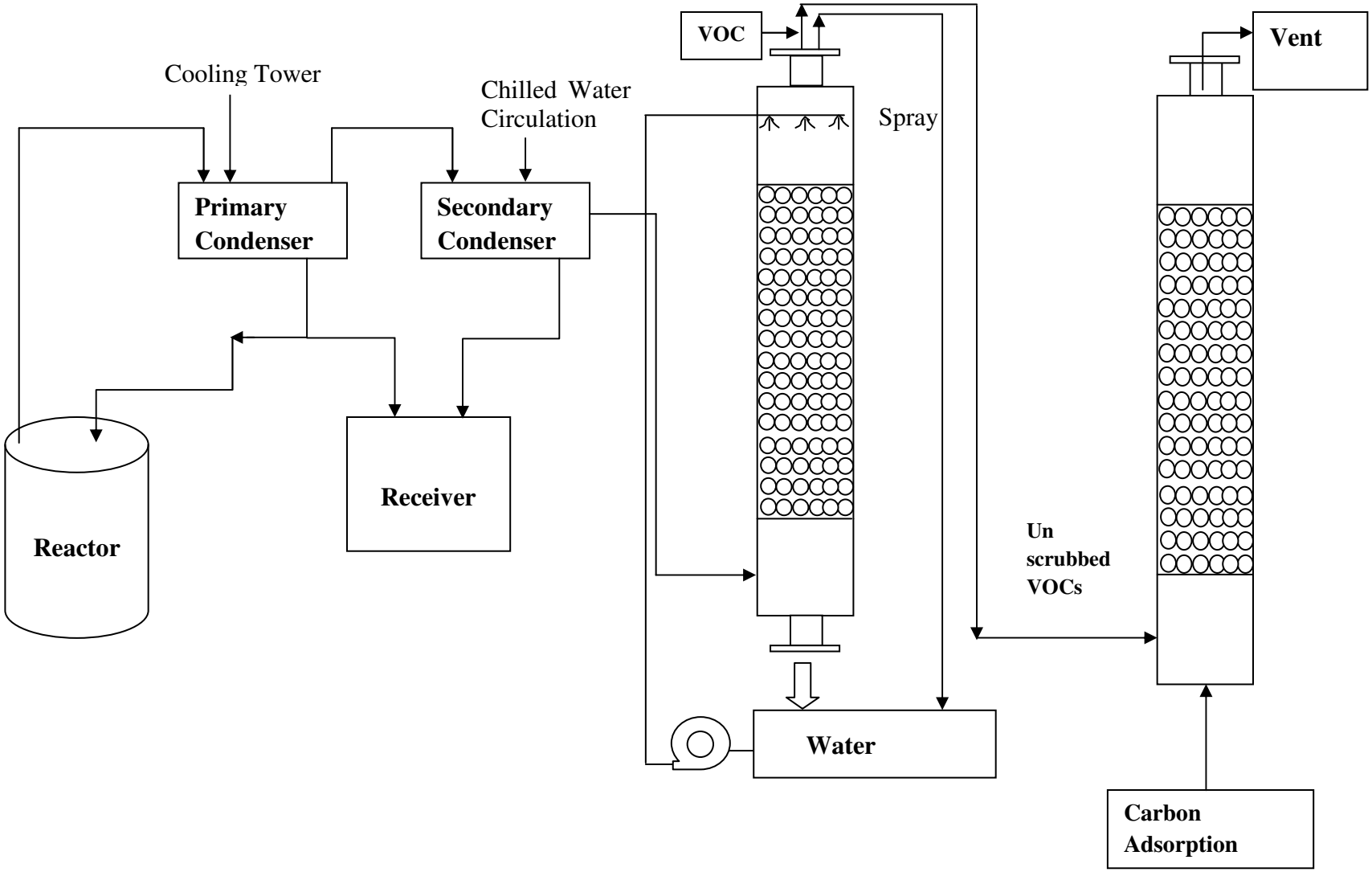
ANNEXURE-12

DETAILS OF SOLVENT RECOVERY

A solvent recovery system comprises of two stage heat exchangers. Cooling tower water will be circulated in primary heat exchanger and in secondary heat exchanger chilled water circulation is done. The uncondensed solvent after the secondary heat exchanger will be diverted to water scrubber the traces of solvent will get dissolved in water. On getting saturation, the solvent mix water will be subjected for recovery of solvent (if feasible) and/or water will be diverted to ETP plant for further treatment the process will ensure no VOC emission from solvent recovery system.

The scrubbing system consists of a scrubber (packed column absorber), an exhaust blower and scrubbing media circulation via pumps followed by carbon adsorption tower. The vapors coming from the process vents and raw material storage area enters the primary scrubber where they are absorbed in water. Thus, the air leaving from the scrubber is clean, which is again feed into the secondary tower consists of carbon to trap any remaining VOC. The figure of scrubber system is given below as figure.

FLOW DIAGRAM OF SOLVENT RECOVERY SYSTEM



ANNEXURE-13

LIST OF HAZARDOUS CHEMICALS AS PER MSIHC RULES

Sr. No.	Name of Chemicals
1.	Methanol
2.	Toluene
3.	Sulphuric Acid
4.	Iso Propyl Alcohol